



ATT 2311 (2311 ISO-BM)

CHEMICAL ANALYSIS (PERCENTAGE BY MASS)

	C	Si	Mn	P	S	Cr	Mo
Guide analysis	0.38	0.30	1.50	0.020	0.003	2.00	0.20
Standard	0.35 - 0.45	0.20 - 0.40	1.30 - 1.60	≤ 0.035	≤ 0.035	1.80 - 2.10	0.15 - 0.25

CHARACTERISTICS

Standard mold steel, economical to machine, easy to polish, hard-chrome platable, grain-reliable, for dimensions ≤ 400 mm thick.

For:

- higher hardness and better through-hardening
- polishability > grain size 320
- delicate grain designs (e. g. HNO₃)
- higher thermal conductivity

we recommend ATT 2738 MOD TS HH

APPLICATION

Small and medium-sized injection molds, compression molds and mold frames up to 400 mm thick.

DELIVERED CONDITION

Hardened and tempered to 280 - 325 HB (950 - 1,100 MPa)*

PHYSICAL PROPERTIES

Thermal Conductivity (W/m.K) at	20°C 34.0	250°C 33.5	500°C 33.0
Thermal Expansion coefficient (10 ⁻⁶ /K)	20-100°C 11.6	20-250°C 12.8	20-500°C 14.3
Young's modulus (GPa)	20°C 212	250°C 197	500°C 175

SEL	40CrMnMo7
DIN EN ISO 4957	40CrMnMo7
AFNOR	40CMD8
AISI	~P20
BS	~P20

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* Surface hardness in Brinell, converted to DIN EN ISO 18265, Table A.1.

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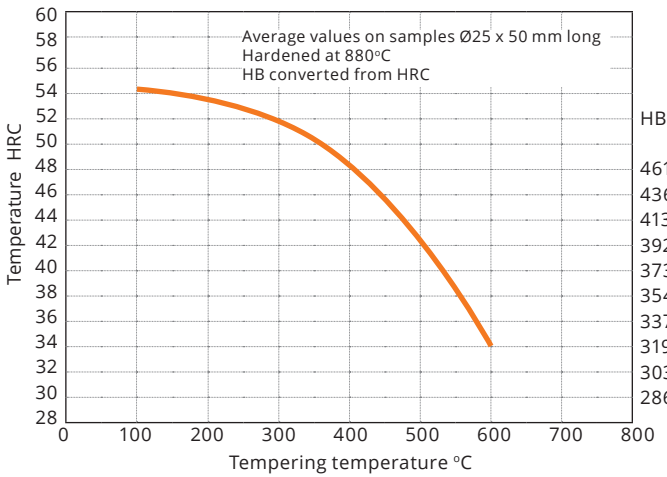


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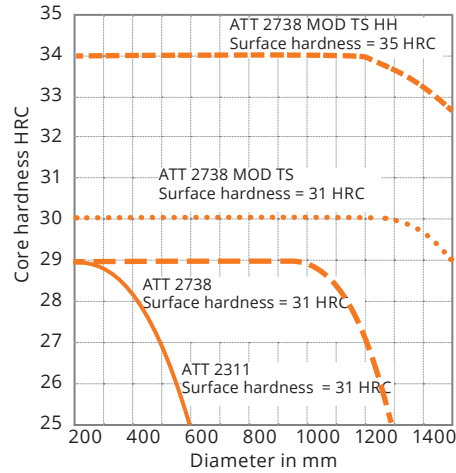
HEAT TREATMENT

Stress relieving	Temperature	Approx. 550°C in the quenched and tempered state
	Duration	1 hour per 50 mm wall thickness
	Cooling	Furnace
Soft annealing	Temperature	720°C
	Duration	1 hour per 25mm wall thickness
	Cooling	Furnace
Hardening	Temperature	880°C
	Duration	1 min per mm wall thickness
Quenching hardness	Max. 54 HRC	in oil, hot bath or vacuum
	Temperature	See tempering curve
Tempering	Duration	1 hour per 25 mm wall thickness
	Cooling	Air
Working hardness	280-325 HB	

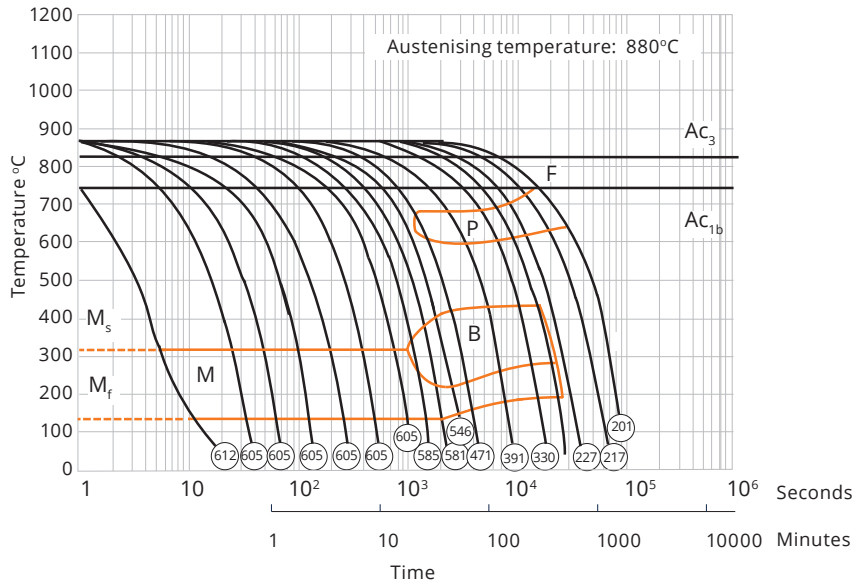
Tempering curve



Through-hardenability (Schematic)



TTT curve (continuous)



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